

to the negative electrode did not differ from that in the vessel adjacent to the positive electrode by more than 1 per cent., and this could be accounted for by errors of experiments, as test experiments, in which the mixture had not been exposed to the electric field, gave differences comparable with these. We should conclude from the preceding experiments that the molecules of a gas are not acted on by any appreciable translational force tending to move them from one place to another, when they are near to a body charged with electricity. To test this point further, two large terminals were placed in bulbs which were connected by a horizontal capillary tube, in which a drop of sulphuric acid was placed; a difference in the pressure of the gas would cause the sulphuric acid to move, and the arrangement acts as a very delicate pressure gauge. The bulbs and tube were filled with chlorine at atmospheric pressure. The terminals were then connected to the electrodes of a battery giving a potential difference of 1200 volts, but not the slightest movement of the drop of acid could be detected.

I wish to acknowledge the help I have received in making the preceding experiment from my assistant, Mr. E. Everett.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

IN the ninth session of Edinburgh Summer Meeting, which was opened by Lord Reay on August 5, and has just concluded, natural science was represented by Elisée Reclus ("On the Evolution of Cities"), Dr. W. W. J. Nicol ("On Every-day Chemistry"), Mr. J. G. Goodchild ("On the Geology of Edinburgh"), Mr. A. J. Herbertson ("On the Geography of the District"), Dr. Louis Irvine ("On the Nervous System"), Mr. J. Arthur Thomson ("On the Biology of the Seasons"), Mr. R. Turnbull ("On Applied Botany"); Prof. Lloyd Morgan lectured "On Evolution Ethics," Prof. Haddon "On the Savage Mind," and Prof. Geddes "On Life and Thought."

MR. JOSEPH BISSETT, who was for two years lecturer at the Agricultural College, Aspatria, has been appointed Agricultural Lecturer to the County of Ayr.

MR. F. G. JONES goes to the Huddersfield Technical School as Lecturer in Physics, Applied Mechanics and Steam, and Mr. J. Brierley is to fill the post of Assistant Master in Chemistry and Physics at the same school.

THE Calendars for the Session 1895-96 of the University College, Bristol, and the Glasgow and West of Scotland Technical College have just been published, and may be obtained, respectively, of Arrowsmith, Bristol, and Anderson, Glasgow.

THE *Educational Times* understands that Mr. Arthur Milman will retire early in 1896 from the Registrarship of London University, under the Civil Service regulation as to age.

SCIENTIFIC SERIALS.

American Meteorological Journal, August.—The principal articles are:—Relation of clouds to rainfall, by H. Helm Clayton. A special study of cloud-forms before and after rain was made at the Blue Hill Observatory, and it was found that the most frequent succession of clouds preceding rain was cirrus, cirro-stratus, alto-stratus, and nimbus; the first which appeared in advance of the rain being usually cirrus. Rain was observed to fall from four classes of clouds: (1) a high cloud sheet (alto-nimbus); (2) a low, ragged cloud sheet (nimbus); (3) long, low rolls of cloud, giving light intermittent showers; and (4) a towering cloud of the cumulus type (cumulo-nimbus). Following rain, the most frequent clouds were strato-cumulus, in long, low rolls, while above there was most frequently cirrus or cirro-stratus. The result of the investigation showed that cloud-forms cannot, in general, be used in predicting rain for more than twenty-four hours in advance, but that, for a few hours in advance, the existence of certain clouds frequently furnish most trustworthy indications of coming rain.—The meteorograph for the Harvard Observatory on El Misti, Peru, by S. P. Fergusson. It has been found impossible to maintain observers at this elevated station (19,300 feet), and during the rainy season, which lasts three or four months,

no ascent can be made. A meteorograph, on the principle of Richard's well-known instruments, has been constructed at the request of Prof. Pickering, which will work for four months, and will be installed on the summit of the mountain this summer. The record drum revolves once during three days, giving to the paper a speed of three inches in a day, and the paper used for the records is rolled upon a removable reel under the record drum. An illustration of the apparatus is given in the journal.

Bulletins de la Société d'Anthropologie de Paris, 1895, fas. 1.—Discussion of the *Pithecanthropus erectus* as the presumed precursor of man, by L. Manouvrier.—This paper contains a critical examination of the remains recently discovered by M. Dubois in Java, upon which an article by Prof. Cunningham has already appeared in NATURE.—The dolmen of Ethiau, by M. Lionel Bonnemère. After a careful examination of the marks upon the dolmen, the author has come to the conclusion that they are not due to atmospheric action but to the hand of man.—Lower terrace of Villefranche-sur-Saône, by M. G. de Mortillet. Many worked flints have been found associated with teeth of *Elephas primigenius* and *Rhinoceros tichorhinus*. At Chelles, the molars *E. antiquus* are common and characteristic, and the teeth of rhinoceros, which are very abundant, appear to belong to a small variety of *R. Merckii*.—The engraved stones of New Caledonia, by M. L. Bonnemère. The author exhibited, in the name of M. Glaumont, collector at Coron, a most interesting series of drawings made by him representing certain remarkable objects from the colony. Many large stones are covered with designs that were evidently executed before the European occupation of the island.

L'Anthropologie, 1895, No. 3.—General considerations on the Yellow Races, by Dr. E. T. Hamy. The opening lecture of the course of Anthropology at the Museum.—Infantilism, feminism, and antique hermaphrodites, by Henry Meige. Several cases in illustration of this paper have been drawn from the patients of Salpêtrière.—Studies in prehistoric ethnography, by Ed. Piette. Many archaeologists have imagined that between the quaternary period and the modern era there was a long interval of desolation, during which the lands of Western Europe were devoid of inhabitants, and the record of human life was interrupted. They named it the *hiatus*. The author traces the history of the harpoon during this period, and shows that no such *hiatus* occurred.—Sculpture in Europe before the Greek-Roman Influences, by M. Salomon Reinach. In this section of M. Reinach's valuable monograph, the subject of gesture is treated, and numerous illustrations of bronze figures are given in illustration of the author's argument.

Bollettino della Società Sismologica Italiana, i., 1895, No. 4.—Vesuvian notices (1894), by G. Mercalli.—On the propagation in Italy of the Lubiana earthquake of April 14, 1895, by M. Baratta. A brief account, with a map showing the course of the isoseismal lines in Italy.—Notices of Italian earthquakes (April 1895). A valuable list of records, principally of the earthquake which forms the subject of the preceding paper.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 20.—"On the Refractive Index of Water at Temperatures between 0° and 10°." By Sir John Conroy, Bart., F.R.S.

In 1856, Jamin (*Comptes rendus*, vol. xliii. p. 1191) published an account of observations he made on the refractive index of water at temperatures between 30° and 0°. He used an interference method, and found that as the water cooled the index increased; similar results have been obtained by other observers, but although it appears to be proved that the refractive index of water increases with the decrease of temperature until the freezing point is reached, few determinations of the values of refractive indices of water near its point of maximum density have been published.

The method employed was the ordinary one, the determination of the angle of minimum deviation for a ray of definite wavelength passing through a hollow glass prism containing water at a known temperature.

The prism was filled with distilled water which had been recently boiled and allowed to cool under reduced pressure, and

was surrounded by a water-jacket, through which a stream of brine, cooled by a freezing mixture, could be passed.

The determinations were made exclusively with sodium light. In the first column of the table the values of the refractive indices, relative to air, for each degree are given to five places; in the second the values as found by Walter, and in the third and fourth those for sodium light, given by Gladstone and Dale, and Rühlmann.

Refractive Indices of Water.

t.	C.	W.	t.	G and D.	t.	R.
0	1'33397	1'33401	0°0	1'33374	0	1'33375
1	1'33397	1'33400	4°0	1'33367	0°0	1'33380
2	1'33396	1'33398	6°5	1'33356	1°5	1'33375
3	1'33394	1'33396	9°0	1'33342	4°0	1'33372
4	1'33392	1'33393	—	—	5°0	1'33371
5	1'33389	1'33390	—	—	5°8	1'33368
6	1'33385	1'33387	—	—	9°9	1'33355
7	1'33382	1'33383	—	—	10°0	1'33353
8	1'33378	1'33379	—	—	—	—
9	1'33375	1'33374	—	—	—	—

The values show that the refractive index of water, as was first announced by Jamin, increases continuously up to the freezing point, the rate of increase, however, seems to change about 4°, the temperature of maximum density, as was pointed out by Gladstone and Dale, and that no formula representing the variation of the refractive index of water with the temperature, as a function of the density only, can be a complete expression of the facts of the case.

PARIS.

Academy of Sciences, August 26.—M. Fizeau in the chair.—Truffles (*Terfîs*) from Cyprus (*Terfezia clavayri*), Smyrna, and La Calle (*Terfezia leonis*), by M. Ad. Chatin.—Observations of Swift's comet (August 20, 1895), made at Lyons Observatory by means of the coude equatorial (0°32 m.), by M. G. Le Cadet. The remark is recorded that this comet appears as a very diffuse and feeble nebulosity almost equally spread in every direction. By oblique vision a nearly central feeble condensation can be distinguished.—Observations of the planet Phao (322), made at Marseilles Observatory by means of the 0°26 m. equatorial, by M. Borrelly.—On regular pencils and the *équivalents* of the *n*th order, by M. Paul Serret.—Heat of solution and of formation of sodium and potassium cyanurates, by M. Paul Lemoult. A detailed thermochemical study. The difficulty of forming the trimetallic salts is emphasised, and it is shown that the sodium and potassium series do not differ essentially. Water does not appear to decompose these salts.—On *apiculée* fermentation, and on the influence of aëration in elliptic fermentation at a high temperature, by MM. M. Rietsch and M. Herselin. Alcohol formed from *apiculée* yeasts requires more sugar for its production than that produced by the agency of elliptic yeasts. Cooling the must to just below 30° and aëration both favour the economical production of alcohol.—On aluminium utensils, by M. Balland. These utensils in ordinary camp use stand wear fairly well, and are not much attacked by foods during the short time they are in contact therewith. They should not be soldered or brought into contact with other metals. In the process of manufacture, treatment with soda should be avoided; the fine matt surface produced is more easily attacked than a polished surface.—On the rôle of the liver in the anticoagulant action of peptone, by MM. E. Gley and V. Pachon. The results of the authors' experiments appear to show that peptone does not itself exert any anticoagulant effect, but that it stimulates the production by the liver of some substance possessing anticoagulant properties.—The ellipsoidal stethoscope, by M. Ch. V. Zenger. A solid homogeneous wooden ellipsoid of revolution is cut by two planes perpendicular to the principal axis, and passing through the two foci. One flat end being placed as usual on the body surface, the ear perceives at the other focus the sounds of organ movements with remarkable intensity, and free from parasitic sounds formed in the air space of the ordinary instrument.—The electrodynamic system of the world, by M. Ch. V. Zenger.

NO. 1349, VOL. 52]

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten*, part 2 for 1895, contains the following memoirs of scientific interest:—

May 25.—O. Hölder: On groups whose order is free from squares.

June 15.—A. Hurwitz: A fundamental theorem in the arithmetical theory of algebraic magnitudes. A. von Koenen: On the selection of points near Göttingen at which differences in the intensity of gravity may be expected in trial pendulum experiments. W. Schur: On the results of the first pendulum trials. W. Voigt: *In memoriam* F. E. Neumann.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Annual Report of the Department of Mines and Agriculture, N.S.W., for the Year 1894 (Sydney).—Diseases of Personality: Prof. Ribot, translated (Chicago, Open Court Publishing Company).—Analytical Key to the Natural Orders of Flowering Plants: F. Thonner (Sonnenschein).—Studies in the Evolutionary Psychology of Feeling: H. M. Stanley (Sonnenschein).—University College, Bristol, Calendar for the Session 1895-1896 (Bristol, Arrowsmith).—Origin of Plant Structures: Rev. G. Henslow (K. Paul).—Bourne's Handy Assurance Manual, 1895: W. Schooling (London).

PAMPHLETS.—Stenopaïc or Pin-hole Photography: F. W. Mills and A. C. Ponton (Dawbarn).—University Correspondence College, Lon. Inter. Science and Prel. Sci. Guide, No. vii. (Red Lion Square).—Ditto Inter. Arts Guide, No. x. (Red Lion Square).

SERIALS.—Indian Museum Notes, Vol. 3, Nos. 4 and 5 (Calcutta).—Chambers's Journal, September (Chambers).—Contemporary Review, September (Isbister).—Good Words, September (Isbister).—Sunday Magazine, September (Isbister).—Humanitarian, September (Hutchinson).—National Review, September (Arnold).—Scribner's Magazine, September (Low).—Fortnightly Review, September (Chapman and Hall).—Clinical Sketches, No. 8, Vol. 2 (Smith, Elder).—Notes from the Leyden Museum, July (Leyden, Brill).—Journal of the Royal Microscopical Society, August (Williams and Norgate).—A Monograph of the Land and Freshwater Mollusca; J. W. Taylor, Part 2 (Leeds, Taylor).—Bulletin de l'Académie Royale des Sciences de Belgique, 65^e Année, No. 7 (Bruxelles).—Zeitschrift für Physikalische Chemie, xvii. Band, 4 Heft (Leipzig).—Katalog der Bibliothek der K. Leopoldisch-Carolinischen Deutschen Akademie der Naturforscher, Sechste Lief. (Halle).—Ditto Repertorium zu den Acta und Nova Acta der Akademie, Erster Band (Halle).—The Asclepiad, No. 43, Vol. xi. (Longmans).

CONTENTS.

PAGE

The Pendulum and Geology. By Rev. O. Fisher . . .	433
Some Recent Books on Mycology. By A. L. S. . . .	435
Our Book Shelf:—	
Dubois: "The Climates of the Geological Past, and their Relation to the Evolution of the Sun" . . .	436
Holzmüller: "Methodisches Lehrbuch der Elementar-Mathematik."—G.	437
Letters to the Editor:—	
Heights of August Meteors.—Prof. A. S. Herschel, F.R.S.	437
Do the Components of Compound Colours in Nature follow a Law of Multiple Proportion?—F. Howard Collins	438
Transformation of Moulds and Yeasts.—R. W. Atkinson; The Writer of the Note	438
Mr. Seeborn von Middendorff's Credibility.—Prof. Alfred Newton, F.R.S.	438
On Photographs of the Moon taken at the Paris Observatory	439
Unscientific Excavations in Egypt	439
Joseph Thomson. By Dr. J. W. Gregory	440
William Crawford Williamson. By Count Solms-Laubach	441
Notes	443
Our Astronomical Column:—	
The Forms of Jupiter's Satellites	445
Ephemeris of Swift's Comet	446
Comets and the Sun-spot Period	446
The Sun's Place in Nature. XI. (Illustrated.) By J. Norman Lockyer, C.B., F.R.S.	446
Science in the Magazines	450
On the Electrolysis of Gases. (Illustrated.) By Prof. J. J. Thomson, F.R.S.	451
University and Educational Intelligence	455
Scientific Serials	455
Societies and Academies	455
Books, Pamphlets, and Serials Received	456